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WHAT SHALL BE DONE WITH THE UNUSUALLY BRIGHT STUDENT?

By Dr. Vernon Kellogg of the
National Research Council

(Science Service)

Washington, D. C. Jan. 00.-- Scientists are working on means of giving exceptionally bright students in colleges and universities the opportunities for developing to their full capacity. Dr. Vernon Kellogg, permanent secretary of the National Research Council, has written the following article on this problem as it was considered at a meeting of the Division of Educational Relations held in Washington, December 23.

"In these days when we are beginning to realize that a college education is a costly thing and when at the same time the accommodations of all of our colleges and universities are being crowded beyond tolerable limits, attention is being more and more closely focused upon carefully discriminating between students of varying degrees of innate ability. The frequent failures in freshmen and sophomore classes indicate that a considerable number of those who have aspired to a college education, for one reason or another, are unable to assimilate it and would really become more useful citizens if they engaged in other pursuits at once."

"At the other end of the scale systematic study indicates that five or even ten per cent of an average student body is made up of students of distinctly superior ability. The actual capacity of these few students is so far ahead of the average capacity of the great body of students as to require unlimited opportunities for best development. While men and women of average capacity will certainly do substantial work it seems logical to expect that the leaders in intellectual activity will come from this small group of unusually gifted men and women. The proper education of these superior students thus becomes a matter of the greatest importance in our system of higher education."

"In order to define the problem and to consider means for systematically studying this situation the Division of Educational Relations of the National Research Council called an informal conference in Washington on December 23 which was attended by a number of men from institutions where the problem of the unusually gifted student has been given distinct attention. In addition to contributions from those who attended the conference there are available the results of a study of this problem which had been made under the auspices of the National Research Council by Professor G. W. Stewart, of the University of Iowa, through personal visits to nearly seventy colleges and universities in the spring of 1921."

"Giving adequate attention to the superior student involves at once a consideration of possible modifications of the standard college curriculum through the introduction of liberal honors courses, relief from routine obligations, extension of library privileges and conferences with instructors, the awarding of fellowships and prizes, and the cultivation of an attitude of respect for intellectual attainment. The whole subject is to give the superior student as

such work as he can satisfactorily carry and at the same time let him take advantage of whatever use the standard courses may be to him which have been devised for the general student body."

"College entrance boards are coming to demand as a basis for their judgment in the admission of students other data than preparatory school records alone or ability to pass stated entrance examinations. Careful tests of mental ability contribute an important element to a basis for sound judgment. The perfection of these composite tests will make it possible to eliminate students who could not hope for success and also to recognize those whose ability is deserving of special cultivation. This movement for the intelligent discrimination of students on the basis of their individual capacity and possibilities for leadership is undoubtedly one of the most important developments in educational progress at present, and it reaches into the high school and grammar school system as well as into the college levels."

The following educators considered the problem: Frank Aydelotte, President, Swarthmore College; S. P. Capen, Director, American Council on Education; J. Crosby Chapman, Associate Professor of Educational Psychology, Yale University; J. J. Coss, Professor of Philosophy, Columbia University; L. T. More, Professor of Physics, University of Cincinnati; A. A. Potter, Professor of Power Engineering, Purdue University; G. W. Stewart, Professor of Physics, University of Iowa; J. J. Tigert, Commissioner, U. S. Bureau of Education; C. E. Seashore, Chairman, Division of Anthropology and Psychology, National Research Council; Vernon Kellogg, Chairman, Division of Educational Relations, National Research Council; A. L. Barrows, Secretary, Division of Educational Relations, National Research Council; F. E. Clements, Carnegie Institution of Washington; F. G. Cottrell, Chairman, Division of Chemistry and Chemical Technology, National Research Council; V. C. Vaughan, Chairman, Division of Medical Sciences, National Research Council.

TO ASSIST IN REORGANIZING
BIBLIOGRAPHIC INSTITUTION

(By Science Service)

Washington, Jan. 00.- Dr. Vernon Kellogg, Permanent Secretary of the National Research Council, sailed for Europe on the "Olympic" December 31 to assist in the reorganization, upon a permanent basis, of the Concilium Bibliographicum at Zurich, Switzerland.

The Concilium Bibliographicum was established in Zurich in 1895 by Dr. Herbert Haviland Field with the intention of making it an international organization for the prompt cataloging and publishing of bibliographic references in science. By devoting his whole time and energy and part of a private fortune to the work and with technical and financial support from various scientific societies and individuals Dr. Field succeeded in developing a very useful scientific bibliographic center which provided promptly issued reference cards in the field of general biology, evolution, physiology, anatomy, zoology and bacteriology, to many subscribers (mostly university libraries and laboratories and individual investigators).

The untimely death of Dr. Field early in 1921, following upon several years of intense activity in connection with the war made it necessary to secure added resources and effect a permanent form of administration for this enterprise. In order to meet the need for resources the Rockefeller Foundation of New York City made generous appropriations available on a diminishing scale during the next five years, at the end of which time it is expected that the Concilium Bibliographicum will have made itself independent through the enlargement of its subscription list. The administration of these funds has been placed in the hands of a joint commission representing the National Research Council and the Swiss Natural History Society.

Dr. Kellogg will also stop in London and will consult with certain representatives of English scientific societies as well as with scientific men on the continent, in regard to the extension of the international relationships of the Concilium Bibliographicum.

YOUR BACTERIA CROP

A New Conception in Preventive Medicine

By Walter Veazie

(Science Service)

The point of view is coming into medicine of considering the human body, or rather its tissues, as soil which may be rendered fertile or otherwise for the bacterial flora. Bacteria are plants and like other plants require a medium in which to grow. Upon their soil we may put fertilizers to promote growth or on the contrary substances which render it relatively sterile.

An example, illustrating this new conception, has recently been called to the attention of the medical world by Professor Edgar Leigh Collis of the Welsh National School of Medicine.

Professor Collis dealt with stone-mason's phthisis or tuberculosis of the lungs. It has generally been considered that the stone dust which the mason breathed acted as sharp-edged particles, lacerating and irritating the lining of the air passages.

Professor Collis has shown, however, that the silica (quartz) of the stone dust acts rather as a chemical than a physical agent, rendering the membrane a better growth-supporting medium for tuberculosis bacilli. If you put lime on some soil you will grow more wheat to the acre, so if you put quartz on the mucous membrane you will raise more bacilli to the square millimeter.

This discovery may open up a new field for the use of drugs in preventive medicine. The method hitherto pursued has been to find a drug which would poison the bacteria and the ensuing difficulty, of course, was that the effective poison would also kill or injure the man.

From this new point of view the task will be to discover a medicine which will so act chemically upon the exposed surface as to render it a poor soil for the microscopic plants which cause disease.

USE WIRELESS IN FIXING AUSTRALIAN FRONTIER

By Thomas Dunbabin

(Science Service)

Sydney, New South Wales, Jan. 00.-- Wireless has just been used for the first time as a means of fixing the boundaries of states. Over half-a-century ago the parallel of 129° East Longitude was chosen as the boundary line between Western Australia on the one hand and South Australia and the Northern Territory on the other. But the line had never been accurately laid down.

As it runs through a wilderness the uncertainty of the border line did not matter. The discovery of oil toward the northern end of the line, however, made it desirable to fix the position exactly.

Moreover the states concerned were anxious to avoid a dispute such as that between Victoria and South Australia where the line, owing to inexact methods used many years ago, was run two miles away from its true position. This dispute lasted 40 years and was only settled by appeal to the British Privy Council.

The work of fixing the true border between Western Australia and the states to the east was undertaken by State Astronomer Curlewis of West Australia and State Astronomer S. F. Dodwell of South Australia. With a field wireless plant they were

able to receive direct the time-signals from the high-power plant at Lyons, France, and also from Annapolis, U. S. A. after allowing one-twenty-fifth of a second for the transmission of the wireless signals, the position of a point on the 129th degree was worked out at each end of the boundary line, at places over 1,000 miles apart.

When asked how nearly to absolute accuracy he had approached in fixing the line Dodwell said, "Well, we're within 30 yards of it."

"There are two possible sources of error: the personal equation and some defect in the instruments. But the concrete blocks at each end of the line are, at most, not more than 30 yards from the place where they should be."

NEW SPRAYING APPARATUS PROTECTS GARDEN TRUCK

(By Science Service)

Gainesville, Fla., Jan. 00.- A new apparatus, which it is believed will cause the trucking industry to take a tremendous step forward, has been designed by Prof. A. H. Beyer of the Florida Experiment Station. This new apparatus is intended for spraying young truck crops and its use makes it almost impossible not to kill insects that formerly succeeded in flying away unharmed before the spraying machines.

Professor Beyer, in addressing a gathering of scientific men at the University of Florida recently, stated that his experiments had been principally with the bean jassid, a small, rapidly flying insect, but that he believed his apparatus and method would be easily applicable to almost any insect, or disease, occurring on any truck crop. He said he plans to conduct extensive experiments and tests along these lines within the next few months.

During the last year the bean crops at the Florida Experiment Station have been complete failures, except where this new spraying apparatus was used. In every case where it was used the beans were good.

The apparatus is simple of design and the method is one easy to understand. Three nozzles, leading from one common force pump to a position close, just above, and on either side of the row of plants, turn loose a veritable hazy flood of fumes of the spraying material. About the nozzles is a cylindrical canvass shield which keeps the spray close into the plants and prevents the bugs from escaping. The plants are literally drenched; every leaf is covered with "bug-death" on both sides, a thing heretofore practically impossible to do.

Two men and one horse have been found sufficient to operate this spraying outfit, which can make nearly as much time as a one-row seed drill. Different sized spray tanks can be used and any one of a number of compression methods are applicable.

It is the consensus of opinion of the specialists of the University of Florida and of the State Plant Board that Professor Beyer's discovery, or invention, will prove of inestimable value to the trucking industry of Florida and the Nation.

DESTROY MOSQUITO WITH "POISON-DUST".

(By Science Service)

Washington, Jan. 00.- Clouds of dust, containing minute quantities of paris green, sprinkled lightly on water where mosquitos collect and breed has been successfully used by the United States Public Health Service as a means of combatting the spread of disease.

Experiments conducted by H. A. Barber, T. B. Hayne, and W. H. W. Komp, have proved that disease-carrying mosquitos will eat anything they find floating or held up by the surface tension of water and that they may be easily poisoned.

"No bait of any kind is required to make these larvae eat anything that is offered them," reported the workers, after trying out the poison-dust in a number of field and laboratory experiments.

A mixture of one part paris green to 100 parts of dust -- road dust was found to be good -- thrown up in a cloud and carried by a light wind and allowed to settle on breeding places was particularly successful.

There is no danger of poisoning the water so that live stock would be injured, the Public Health Service men reported. The only danger of poisoning, they pointed out, is due to the possibility of inhaling the dust, which is slight.

The poison-dust method is also successful in treating marshes where reeds grow thickly, grass-covered ponds, ditches and similar breeding places.

The Public Health Service experiments were founded on the work of E. Roubaud, a French Scientist, who used trioxymethylene or paraformaldehyde in poisoning anopheline larvae. The use of paris green has been found superior.

NEWS OF THE STARS

Sirius.- The Most Brilliant Diamond in the Sky.

By Isabel M. Lewis
of the U.S. Naval Observatory

(Science Service)

On clear, frosty, winter evenings one may see that most magnificent of all celestial jewels, Sirius, The Dog-Star, in Canis Major, The Greater Dog, almost in line with the Belt of Orion in the eastern sky and some twenty degrees to the southeast of it, scintillating and flashing lights of varied colors and far outshining any other star in the heavens.

As Sirius never attains a great height above the southern horizon in our latitudes and is, in addition, exceptionally bright its rays are strongly refracted or broken up by the atmosphere which exerts its greatest effect on bright objects close to the horizon. As a result it twinkles and flashes far more conspicuously than any other star. This sparkling of Sirius and its flashing of lights of varied color makes it a most gorgeous object to view in the telescope, but for the same reason, one of the most difficult to observe.

Almost completely hidden from view in the brilliant rays of Sirius is a faint companion star which revealed its presence by the manner in which it perturbed the motion of its brilliant neighbor through gravitational attraction, long before it was detected visually by Alvan G. Clark, while testing the 18-inch telescope of the Dearborn Observatory in 1862.

The companion star is about as far from Sirius as Neptune is from the sun and the two stars complete a revolution about their common center of gravity in 48.8 years. The fainter star is one of the most feebly luminous stars known, having only one twenty-thousandth part of the luminosity of Sirius. It would take twenty thousand stars as bright as this companion star, to give as much light as Sirius. In spite of its feeble light the faint star is half as massive, that is, it would weigh half as much, as Sirius. The two stars combined weigh three and a half times as much as our own sun. The light of Sirius is equal to the combined light of forty-eight suns as bright as our own. Though refraction of the light of Sirius by the atmosphere causes it to flash the spectral colors, it is in reality one of the intensely white hydrogen stars of great brilliancy.

The Sirian system is at a distance of about eight and half light years from the earth and there are only two stars nearer to us. One of these is the well-known Alpha Centauri and the other a faint star catalogued as Lalande 21.185. On a scale in which one inch represents the distance of the earth from the sun the Sirian system would be placed about eight miles away.

Sirius belongs to a moving cluster of stars known as the Ursa Major cluster, which consists of at least thirteen members, five of which are stars in the Big Dipper and another the bright star Beta, in Auriga. These stars are all moving in the same general direction through space and are arranged in the form of a disk of diameter about 160 light years, and width 15 light years. The sun lies at present in the midst of this cluster and so the various members of the cluster appear to us to be widely scattered over the sky. Sirius, the nearest member, is but eight light years distant while the stars of the Big Dipper are 75 light years distant and Beta Aurigae is at a distance of 135 light years. The cluster is now slowly overtaking the solar system and in the course of ages will pass it.

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VERTICAL LINES WILL NOT PASS ✓
THROUGH THE CENTER OF THE EARTH

(By Science Service)

Washington, D. C., Jan. 00.- It is generally assumed that any vertical line, i.e., any line straight up and down, if projected will pass through the center of the earth. This, however, turns out not to be the case except for such positions as the earth's poles or on the equator.

The earth is not a sphere, but has the form of an ellipsoid of revolution of slight eccentricity. The result is that any vertical line, except at the places just mentioned, will not pass through the center but will intersect the axis north or south of the center, and will emerge from the opposite side not as a vertical line but making a slight angle with the vertical.

For instance, for a person at the latitude of Washington, a vertical line would pass through the axis of the earth at a point south of the center. According to the figures furnished by the U. S. Coast and Geodetic Survey, for the Washington observer, the line would intersect the axis 16.86 miles south of the center, and the nearest approach this line would make to the center would be 13.13 miles.

DO YOU KNOW THAT -

Soy beans are unique among beans in that their principal stock of stored food consists of oil instead of starch.

Bees seem to have a special antagonism for black, and become much more excited than usual if the bee-keeper wears a black veil or black clothing while working with them.

Potatoes, probably still closely resembling the original ancestral stock, are still cultivated by the natives of the uplands of Peru and Bolivia, the first home of the potato. They are hard and bitter, and at their best are not much larger than golf balls.

The young shoots of a giant grass from the Falkland Islands can be used like asparagus. The Department of Agriculture is introducing this grass into American cultivation.

DO YOU KNOW THAT -

The "lily of the fields" of the New Testament parable is not a lily but a peculiarly brilliant iris that grows wild in Palestine. Until very recently all irises were classed with lilies. The "fleur-de-lis" (literally "lily-flower") of French heraldry is also an iris.

Chlorophyll, the green coloring matter in plants, and hemoglobin, the red coloring matter of blood corpuscles, are closely allied in their chemical makeup. It is for this reason that physicians recommend "greens" as a part of the diet in the treatment of anemia.

Experiments are being carried on at the University of Illinois with a recently discovered micro-organism that causes the death of mosquito larvae, or "wigglers". It is hoped that man will at last be able to retaliate in kind upon the mosquito for the deadly epidemics this pest has caused.

There are no true pine trees south of the equator, except one species in Java, which just manages to cross the line.

DO YOU KNOW THAT -

The common buckthorn is the alternate host, or carrier, of one stage of the crown rust of oats. A campaign of destruction will probably have to be waged against it, similar to the one now in progress against the barberry, which harbors black stem rust of wheat.

Most sharks do not lay eggs, after the fashion of other fishes. Eggs are formed, but they are retained within the body of the female until they are hatched, when the young are born ready to swim.

Psychological science apparently has exploded the good old notion that "babies will reach for the moon". Dr. John B. Watson states in the current number of the Scientific Monthly that when actually put to the test they will watch attentively anything they see moving, no matter what its distance, but that they will not reach for it until it is within twenty inches of them.

DO YOU KNOW THAT -

The phosphorescent glow of "punk wood" sometimes found in damp places is due to the presence of vast numbers of luminous bacteria and other lower organisms.

The "flowers" of the poinsettia are not true flowers at all, but rosettes of colored leaves. The real flowers are the small, yellowish-green objects at the center.

The teredo, or shipworm, so destructive to wharves and piling, is not properly a worm at all, but a mollusk and thus a relative of the clam and the oyster.

Most bacteria are little affected by cold. The germs of typhoid fever, for example, can be frozen into a solid block of ice and still be capable of mischief when they are thawed out.

DO YOU KNOW THAT -

The condor is commonly thought of as a South American bird. There is, however, a giant North American condor, that lives in the remoter mountain fastnesses of California.

The "sycamore" referred to in the Bible is not the tree known by that name in this country, but a kind of fig tree. Our sycamore is the Biblical "plane tree".

Tree seeds vary greatly in the amount of time they take before they sprout. Seeds of the Kentucky coffee tree must lie in the ground at least two years before their hard coats are sufficiently softened to allow the sprout to escape, while cottonwood seeds die within a few hours if they do not fall on favorable soil.

A grower at Burlington, Iowa, has succeeded in producing a cross between the pecan and the hickory nut. The new hybrid resembles a pecan in appearance, but is hardy much farther north.

DO YOU KNOW THAT -

When a starfish or sea-urchin has eaten something that it finds disagreeable, it does not merely "throw up" the unwelcome meal, but ejects its whole digestive apparatus along with it, and proceeds to grow a new set.

Over three hundred varieties of the soy bean are cultivated in China.

Plants utilize in their food-making processes less than one per cent of the sunlight they receive.

The Easter lily is a comparatively new thing in Christendom. It was introduced from Japan about fifty years ago.